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NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Preparing Activity: KSC

NASA/KSC-08 70 00.00 98 (April 2006)

Superseding
NASA/KSC-08711 (March 2003)

References are NOT in agreement with UMRL dated 01 April 2006

Revised throughout - changes not indicated by CHG tags

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04/06

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SECTION 08 70 00.00 98

HARDWARE
04/06

****
NOTE: Delete, revise, or add to the text in this section to cover project requirements. Notes are for designer information and will not appear in the final project specification.

This section covers builder's finish hardware, locks and door trim, hinges, closers, door stops, UL-listed fire exit hardware, pulls, plates, and miscellaneous hardware.

This section does not include cabinet hardware, hardware for factory-finished counters and cabinets, folding partitions, laboratory or kitchen equipment, toilet partitions and doors, metal lockers, or equipment which normally is furnished complete with hardware.

Drawings must indicate door locations and swing, must schedule rooms, type of door frame, type of door, door elevation and dimensions, door-accessory fittings, and details which will affect the size and design of hardware fittings.

Brackets are used in the text to indicate designer choices or locations where text must be supplied by the designer.
****

PART 1 GENERAL

1.1 REFERENCES

****
NOTE: This paragraph is used to list the publications cited in the text of the guide specification. The publications are referred to in the text by basic designation only and listed in this paragraph by organization, designation, date, and title.

Use the Reference Wizard's Check Reference feature

when you add a RID outside of the Section's Reference Article to automatically place the reference in the Reference Article. Also use the Reference Wizard's Check Reference feature to update the issue dates.

References not used in the text will automatically be deleted from this section of the project specification when you choose to reconcile references in the publish print process.

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The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

ALUMINUM ASSOCIATION (AA)

AA DAF-45	(2003) Designation System for Aluminum Finishes

ASTM INTERNATIONAL (ASTM)

ASTM D 1056	(2000) Standard Specification for Flexible Cellular Materials - Sponge or Expanded Rubber

BUILDERS HARDWARE MANUFACTURERS ASSOCIATION (BHMA)

ANSI/BHMA A156.1	(2000) Butts and Hinges
ANSI/BHMA A156.16	(2002) Auxiliary Hardware
ANSI/BHMA A156.18	(2000) Materials and Finishes
ANSI/BHMA A156.2	(2003) Bored and Preassembled Locks and Latches
ANSI/BHMA A156.3	(2001) Exit Devices
ANSI/BHMA A156.4	(2000) Door Controls - Closers
ANSI/BHMA A156.5	(2001) Auxiliary Locks and Associated Products
ANSI/BHMA A156.6	(2005) Architectural Door Trim
ANSI/BHMA A156.8	(2000) Door Controls - Overhead Stops and Holders

U.S. GENERAL SERVICES ADMINISTRATION (GSA)

FS FF-P-101	(Rev F) Padlocks

1.2 SUBMITTALS

****

NOTE: Review Submittal Description (SD) definitions in Section 01 33 00 SUBMITTAL PROCEDURES and edit

the following list to reflect only the submittals required for the project. Submittals should be kept to the minimum required for adequate quality control.

A "G" following a submittal item indicates that the submittal requires Government approval. Some submittals are already marked with a "G". Only delete an existing "G" if the submittal item is not complex and can be reviewed through the Contractor's Quality Control system. Only add a "G" if the submittal is sufficiently important or complex in context of the project.

For submittals requiring Government approval on Army projects, a code of up to three characters within the submittal tags may be used following the "G" designation to indicate the approving authority. Codes for Army projects using the Resident Management System (RMS) are: "AE" for Architect-Engineer; "DO" for District Office (Engineering Division or other organization in the District Office); "AO" for Area Office; "RO" for Resident Office; and "PO" for Project Office. Codes following the "G" typically are not used for Navy, Air Force, and NASA projects.

Choose the first bracketed item for Navy, Air Force and NASA projects, or choose the second bracketed item for Army projects.

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Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are [for Contractor Quality Control approval.][for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government.] Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Material, Equipment, and Fixture Lists shall be submitted for finish hardware in accordance with the paragraph entitled "General Requirements," of this section.

SD-02 Shop Drawings

Installation Drawings shall be submitted for finish hardware in accordance with the paragraph entitled "General Requirements," of this section.

SD-03 Product Data

Manufacturer's catalog data shall be submitted for the following items:

Fasteners
Hinges
Locksets
Latchsets

Deadlocks
Night Latches
Exit Bolts
Removable Mullions
Pulls and Push Plates
Push and Pull Bars
Thresholds
Lever Extension Flush Bolts
Coordinating Device
Miscellaneous and Shelf Hardware
Weatherstripping Materials
Spare Parts
Door Roller Latches

SD-04 Samples

Samples of each hardware item shall be submitted in accordance with the paragraph entitled, "General Requirements," of this section.

SD-06 Test Reports

Test reports shall be submitted for the following tests in accordance with paragraph entitled, "General Requirements," of this section:

Finishes
Flammability Tests
Deformation Tests
Colorfastness Tests

SD-07 Certificates

Certificates for finish hardware shall be submitted in accordance with the paragraph entitled, "General Requirements," of this section.

SD-08 Manufacturer's Instructions

Manufacturer's Instructions shall be submitted for each finish hardware item in accordance with the paragraph entitled, "General Requirements," of this section.

1.3 DELIVERY

Hardware shall be delivered properly wrapped and sealed in the manufacturer's original cartons complete with the correct fastenings.

Each item of hardware shall be labeled for room and location and identified with the proper door frame and hardware schedule number.

1.4 TEMPLATES

Hardware attached to metal shall be made to a template.

1.5 FINISHES

Hardware shall receive the following finishes conforming to ANSI/BHMA A156.18, as indicated:

[Satin bronze: 612 on bronze metal, 639 on steel]

[Satin chrome: 626 on brass or bronze metal, 652 on steel]

[Satin aluminum: 628]

[Satin corrosion-resistant steel: 630]

[Plastic laminate: black; brown]

[Where a bronze finish approximating the color of 612 or 639 cannot be obtained in the specified articles of hardware or parts thereof, such parts shall be electroplated to match the specified finish.]

[Aluminum hardware items shall be anodized to an Architectural Class 11 natural finish not less than 0.10 millimeter 0.4 mil thick and conforming to AA DAF-45 (designation AA M21 C22 A 31).]

1.6 GENERAL REQUIREMENTS

Material, Equipment, and Fixture Lists shall be submitted for finish hardware prior to submitting the hardware schedule consisting of a list of the proposed finish hardware by manufacturer, type, name, series, material, and finish.

Installation Drawings shall be submitted for finish hardware including a hardware schedule indicating the door and frame location, type, size, swing, bevel, material, hardware type by Builders Hardware Manufacturer's Association (BHMA) numbers, and the respective manufacturer's type, name, number, finish, and design.

Manufacturer's Instructions shall be submitted for each finish hardware item showing the manufacturer's recommended method and sequence of installation.

Certificates for finish hardware on file at Federal Supply Service, 7th and D Street, S.W., Washington, D.C., 20407, shall state that the hardware sample submitted for use in the project conforms in all respects to the samples on file in Washington, D.C.

Samples of each type of hardware item, including cylinder and construction core properly marked and tagged for identification, shall be submitted by the contractor for approval. Samples which are on file at Federal Supply Service, 7th and D street, SW, Washington, D.C., 20407, shall be identified with an "F" on the sample tag. Samples which are not on file in Washington, D.C., shall be identified with an "NF" on the sample tag. Samples will be returned to the contractor and approved samples may be incorporated into the work with their location accurately recorded.

Flammability Tests, Deformation Tests and Colorfastness Tests shall be submitted in accordance with referenced standards in this section.

PART 2 PRODUCTS

2.1 FASTENERS

Fasteners of the proper type, size, quantity, and finish for each hardware item shall be provided. Machine screws and expansion shields shall be used

for attaching hardware to concrete, stone, or masonry. All visible fasteners shall be phillips-head bronze or corrosion-resistant steel finished to match specified hardware. Screws or bolts for the jamb leaf of half-surface, half-mortise, and full-surface hinges shall be the tamperproof type.

2.2 HINGES

Hinges shall be button-tip template and nontemplate types conforming to ANSI/BHMA A156.1, finish and type as specified in the hardware schedule.

Hinges for exterior doors shall be bronze or corrosion-resistant steel unless otherwise specified.

Exterior doors and interior reverse bevel doors shall have hinges with nonremovable pins.

Exterior doors, doors with closers, and doors 1020 millimeter 40 inches wide and wider shall have hinges with ball bearings or oil-impregnated bearings.

Doors hung on offset floor hinges shall have an intermediate pivot.

Doors 1500 millimeter 5 feet and less in height shall have not less than 2 hinges. One additional hinge shall be provided for each additional 760 millimeter 30 inches in height or fraction thereof.

Hinges shall have leaves of sufficient width to clear the trim but not less than the following sizes:

DOOR THICKNESS	HINGE SIZE
19 millimeter	50 by 50 millimeter
22 millimeter	64 by 50 millimeter
28 millimeter	64 by 64 millimeter
35 millimeter	90 by 90 millimeter
43 millimeter	114 by 114 millimeter
57 millimeter	127 by 127 millimeter
Doors wider than 1016 millimeter	127 by 114 millimeter

DOOR THICKNESS	HINGE SIZE
3/4 inch	2 inches by 2 inches
7/8 inch	2-1/2 inches by 2 inches
1-1/8 inches	2-1/2 inches by 2-1/2 inches
1-3/8 inches	3-1/2 inches by 3-1/2 inches
1-3/4 inches	4-1/2 inches by 4-1/2 inches

DOOR THICKNESS	HINGE SIZE
2-1/4 inches	5 inches by 5 inches
Doors wider than 40 inches	5 inches by 4-1/2 inches

2.3 LOCKSETS

****
NOTE: Revise the first paragraph for special design or for cast trim.
****

Locksets and Latchsets shall conform to ANSI/BHMA A156.2, plain design, wrought trim, and shall be the product of a single manufacturer except for special-function locks and where indicated otherwise.

Lock and latchsets shall have standardized fronts, cases, and strikes so that varying functions will be interchangeable and will require only one mortise for their installation. Locks and latches shall have beveled bronze fronts, bronze bolts and strikes, brass hubs, and cases with the finish specified. Locks shall have cylinders conforming to ANSI/BHMA A156.5.

****
NOTE: The following three paragraphs shall be used for all KSC standard lockset requirements.
****

All cylinders shall be 7-pin removable core type and shall be capable of receiving Best Universal Lock Company's core No. 7A7A 1 or No. 7A7A 2. Standard mortise cylinders shall have an outside diameter of 29.2 millimeter 1.150 inches with 32 threads per 25 millimeter inch, with depth of threads of 0.69 millimeter 0.027 inch. Cylinders for rim locks shall have an outside diameter of 29.16 millimeter 1.148 inches, adjustable for door thickness of 35 millimeter to 72 millimeter 2-7/8 inches.

All locks for exterior doors shall be furnished and installed complete with cylinder and construction core. Two keys, properly tagged and designated as to location, shall be furnished for each construction core.

All locks for interior doors shall be furnished and installed without cylinder or core and with a temporary wood or metal cylinder opening cover.

****
NOTE: Revise the following paragraph if requirements for center require different keying.
****

Notwithstanding the provisions of the General Provisions, all locksets and lock cylinders shall be master keyed to the key system established for the center.

****
NOTE: Delete the following paragraph where project does not need temporary locks.
****

Temporary-construction cores shall be furnished, installed, and maintained

in locks during construction and removed when directed.

****
NOTE: Select the type of lockset required. Revise the selection if other series, designs, or cast-hardware types are required.
****

Lock and latchsets shall be Series 1000, Grade 3, as specified in the hardware schedule.

Lock and latchsets shall be Series 1000, Grade 2, as specified in the hardware schedule.

Lock and latch set for fire-rated doors shall be UL listed and labeled Series 1000, Grade 1, as specified in the hardware schedule.

Lock and latchsets shall be Series 4000, Grade 2, as specified in the hardware schedule.

Lock and latchsets shall be Series 4000, Grade 1, as specified in the hardware schedule.

Lock and latchsets for fire-rated doors shall be UL listed and labeled with a minimum latch-bolt throw of 19 millimeter 3/4 inch, Series 4000, Grade 1, as specified in the hardware schedule.

Locksets for sliding doors shall be the half-mortise latch type with flush pull, Type E16161.

2.4 TUBULAR CYLINDER DEADLOCKS AND NIGHT LATCHES

Deadlocks and night latches shall conform to ANSI/BHMA A156.5, finish as specified in the hardware schedule.

2.5 DOOR ROLLER LATCHES

Roller latches shall be the adjustable, spring-loaded type with a forged bronze front and strike conforming to ANSI/BHMA A156.16, finish as specified in the hardware schedule.

2.6 EXIT BOLTS

Bolts shall conform to ANSI/BHMA A156.3 and shall be the type, function, and finish specified in the hardware schedule. Exit bolts shall be listed in the UL and shall bear the UL label.

2.7 REMOVABLE MULLIONS

****
NOTE: Drawings must indicate location, length and details of mullions.
****

Mullions shall conform to ANSI/BHMA A156.3 and shall be complete with wrought-steel or cast-iron top and bottom plates, cast-brass or bronze 4-way adjustable strike plates, cadmium-plated mounting screws, and expansion shield fasteners.

2.8 PUSH AND PULL BARS

Bars shall be the single horizontal type, plain design, conforming to ANSI/BHMA A156.6, Type J500, fabricated from solid extruded bronze, aluminum, or corrosion-resistant steel, finish as specified. Bar size shall be not less than 31 by 10 millimeter 1-1/4 by 3/8-inch thick, total projection 19 millimeter 3/4 inch.

Bars shall be a pair of horizontal bars and a vertical pull of a plain design, conforming to ANSI/BHMA A156.6, Type J500, fabricated from solid extruded bronze, aluminum, or corrosion-resistant steel, finish as specified. Each bar shall be not less than 31 by 10 millimeter 1-1/4 inches by 3/8-inch thick by 57 millimeter 2-1/4 inches total projection. Vertical bar shall be not less than 300 by 31 by 10 millimeter 12 inches by 1-1/4 inches by 3/8-inch thick.

2.9 PULLS AND PUSH PLATES

Pulls and push plates shall conform to ANSI/BHMA A156.6, types and material as specified.

Pulls shall be Type J400, straight design, bronze, corrosion-resistant steel or aluminum, finish as specified, not less than 250 by 31 by 10 by 43 millimeter 8 by 1-1/4 inches by 3/8 inch by 1-3/4 inchesprojection, bar profile pull, with rounded edges, through-fastened to the door with two machine screws.

Pulls shall be offset design, bronze, corrosion-resistant steel, or aluminum, finish as specified, not less than 250 by 25 by 72 millimeter 10 inches by 1 inch by 2-7/8 inches projection, through-fastened to the door with two machine screws.

Door pulls on plates shall be Type J400, finish as specified, with the wrought plate not less than 350 by 96 by 1.27 millimeter 14 by 3-1/2 inches by 0.050-inch thick, grip center to center, 150 millimeter 6 inches, with cutouts for cylinders and thumb turns as required.

Flush cup pulls shall be Type J400, finish as specified.

Push plates shall be wrought brass, bronze, aluminum, or corrosion-resistant steel, finish as specified, Type J300, not less than 90 by 356 by 1.27 millimeter 3-1/2 by 14 inches by 0.050-inch thick, with cutouts for cylinders and thumb turns as required.

2.10 THRESHOLDS

****
NOTE: Drawings must indicate locations and dimensions of thresholds.
****

Aluminum thresholds shall be provided for the full width of the opening at exterior doors. Thresholds for aluminum doors are specified in Section 08 11 16.00 40 ALUMINUM DOORS AND FRAMES.

Thresholds shall be mill-finish extruded aluminum 6063-T5 alloy conforming to ANSI/BHMA A156.3 or to ANSI/BHMA A156.6, type as specified.

Bronze thresholds shall be provided for the full width of each opening at

exterior doors. Thresholds for aluminum doors are specified in Section 08 11 16.00 40 ALUMINUM DOORS AND FRAMES. Thresholds shall be extruded architectural bronze, mill finish, conforming to ANSI/BHMA A156.6, type as specified.

2.11 LEVER EXTENSION FLUSH BOLTS

****
NOTE: Revise the paragraph if other than a 300 millimeter 12-inch extension is required or if applicable codes restrict the use of manual flush bolts.
****

Flush bolts shall be cast or extruded brass or aluminum, finish as specified, conforming to ANSI/BHMA A156.16, with 300 millimeter 12-inch lever extensions.

Flush bolts shall be a type listed in UL "Building Material Directory" for fire-rated doors.

Automatic extension flush bolts shall conform to ANSI/BHMA A156.3.

2.12 CLOSERS

Closers shall conform to ANSI/BHMA A156.4, finish, type, and size as specified in the hardware schedule.

Closers shall be provided on emergency fire exit, UL labeled, exterior, toilet room, and general office doors and where specified in the hardware schedule.

Closers shall be the surface mounted overhead type and shall be the product of a single manufacturer except where not practicable and where specifically indicated otherwise. Parallel-arm closers shall be used for outswinging exterior doors, doors under 2100 millimeter 7 feet in height, and when special conditions require parallel-arm operation.

Surface-mounted and concealed overhead closers shall be liquid controlled rack-and-pinion construction with cast-iron cases and a spindle of not less than 14 millimeter 9/16-inch diameter. Closers shall have an adjustable torsion-spring 2-speed closing action and a fully adjustable controlled backcheck valve. Valve controls shall be key regulated.

Closer arms shall be fabricated from forged steel or ductile iron. Ductile-iron arms shall be provided for parallel-arm closer operation. Exposed arms of closers shall have a sprayed-on finish matching the lockset or exit-hardware finish.

Floor closers shall be the type, style, and function specified. Exposed face plates shall match the lockset or exit-hardware finish.

Fusible-link holders, if permitted, or electromagnetic hold-opens shall be used on closers for fire-rated doors which require hold-open devices.

Hold-open devices shall be provided on all closers except labeled doors and exterior doors.

Brackets, reinforcing plates, and accessory fittings shall be provided as

required.

2.13 COORDINATING DEVICE

A coordinating device shall be provided for each pair of doors with an overlapping astragal or with rabbeted stiles.

Coordinating device shall conform to ANSI/BHMA A156.3, bronze or corrosion-resistant steel, finish to match the locksets.

2.14 MISCELLANEOUS AND SHELF HARDWARE

2.14.1 General

Miscellaneous hardware shall conform to ANSI/BHMA A156.16, ANSI/BHMA A156.6, and ANSI/BHMA A156.8, and shall match or have the same finish as lockset finish, except when indicated otherwise.

****
NOTE: Drawings must indicate location and construction details for applicable miscellaneous hardware items.
****

2.14.2 Door Holders

Door holders shall be one of the following types:

Lever floor with replaceable rubber tip, Type L11381 or L11391

Floor spring-actuated roller, Type L11301, L11311, or L11331

Floor spring bumper, Type L11241

Concealed overhead slide, automatic, Type C01511

Surface-mounted overhead slide, automatic, Type C02511

2.14.3 Door Stops and Roller Bumpers

Door stops or bumpers shall be provided for all doors to protect the hardware and prevent doors from striking walls and fixtures.

Wall-mounted door stops Types L12071 or L12111 shall be provided where practicable. Where impossible to install wall-mounted stops, floor-mounted stops, Type L12141 or L12161, shall be provided.

A roller bumper shall be provided where two doors interfere with each other in swinging, Type L12191, L12201, or L12211.

2.14.4 Door Silencers

Door silencers shall be provided except where specifically indicated otherwise.

Door silencers shall be Type L03011 for metal frames and Type L03021 for wood frames.

Three silencers shall be provided for single doors and four for dutch

doors. Two silencers shall be provided for each leaf of pairs of doors for installation in the head rail of the door frame.

2.14.5 Plastic Push and Kick Plates

Push plates shall be 3 millimeter 1/8-inch thick plastic laminate, Type J300, conforming to ANSI/BHMA A156.6, size as indicated, color as specified.

Kick plates shall be 3 millimeter 1/8-inch thick plastic laminate, Type J100, conforming to ANSI/BHMA A156.6, color as specified. Width of kick plates shall be 50 millimeter 2 inches less than the door width. Height of kick plates shall be 200 millimeter 8 inchesexcept as indicated; when the bottom rail of the door is less than 213 millimeter 8-1/2 inches, the kick plates shall extend to within 13 millimeter 1/2 inch of the panel mold or bead.

2.14.6 Metal Kick Plates, Mop Plates, and Armor Plates

Plates shall be 1.6 millimeter 0.062-inch wrought brass, bevel-edge plates, Type J100, conforming to ANSI/BHMA A156.6, finish as specified. Width of kick plates shall be 50 millimeter 2 inches less than the door width. Height of kick plates shall be 200 millimeter 8 inchesexcept as indicated; when the bottom rail of the door is less than 213 millimeter 8-1/2 inches, the kick plates shall extend to within 13 millimeter 1/2 inch of the panel mold or bead.

Plates shall be 1.27 millimeter 0.050-inch corrosion-resistant steel, bevel edge, Type J100, conforming to ANSI/BHMA A156.6, finish as specified. Width of kick plates shall be 50 millimeter 2 inchesless than the door width. Height of kick plates shall be 200 millimeter 8 inches except as indicated; when the bottom rail of the door is less than 213 millimeter 8-1/2 inches, the kick plates shall extend to within 13 millimeter 1/2 inch of the panel mold or bead.

Plates shall be 1.6 millimeter 0.064-inch wrought aluminum, bevel edge, Type J100, conforming to ANSI/BHMA A156.6, finish as specified. Width of kick plates shall be 50 millimeter 2 inches less than the door width. Height of kick plates shall be 200 millimeter 8 inchesexcept as indicated; when the bottom rail of the door is less than 213 millimeter 8-1/2 inches, the kick plates shall extend to within 13 millimeter 1/2 inch of the panel mold or bead.

2.14.7 Clothes Hooks

Hooks shall be cast or forged brass, bronze, or aluminum, with two hooks and projecting 75 millimeter 3 inches, Type L13111 or L33112.

2.14.8 Clothes-Hanger Bars

Bars shall be nickel-plated wrought-brass telescoping tubing with the outer tube not less than 1 inch in diameter, wall thickness not less than 0.8 millimeter 1/32 inch, nickel plated brass end flanges, adjustable in sizes from 460 to 3660 millimeter 18 to 144 inches. Intermediate supports shall be provided on all spans over 1220 millimeter 48 inches; one support for spans to 1830 millimeter 72 inches, 2 supports for spans to 2440 millimeter 96 inches.

Bars shall be chrome-plated heavy-wall steel tubing, 26.5 millimeter 1-1/16-inch outside diameter, weighing 190 grams per meter 1.4 pounds per

linear foot, cut to the width of the opening, chrome-plated steel wall flanges, two countersunk screw holes, one wall flange with an open top. Intermediate supports shall be provided on all spans over 1830 millimeter 72 inches; one support for spans to 2740 millimeter 108 inches; two supports for spans to 3660 millimeter 144 inches.

2.14.9 Padlocks

Padlocks shall conform to FS FF-P-101, Type EPC, size 50 millimeter 2 inches, 6-pin tumbler with solid-brass case except as otherwise indicated.

2.14.10 Automatic Door Bottom

Door bottom shall be an automatically operating assembly composed of a rubber seal, a metal seal housing, and an automatic operating device mounted on the bottom of the door as indicated. Device shall be designed to seal the space between the bottom of the door and the finished floor when closed and to retract immediately when the door is opened to provide a sill clearance of approximately 6 millimeter 1/4 inch.

Seal material shall be a closed-cell, expanded cellular rubber conforming to ASTM D 1056, Type S, Grade SBE 41 or SCE 41, mounted in an extruded aluminum shape not less than 10 by 16 millimeter 3/8 by 5/8 inch.

Door-bottom housing shall be surface-mounted extruded anodized aluminum, 13 millimeter wide by 53 millimeter 1/2 inch wide by 2-1/8 inches deep by the full width of the door.

2.14.11 Letter Box Assembly

Plate shall be plain design, forged brass or bronze finish as specified, and shall conform to ANSI/BHMA A156.16, Type L16011, with an inside cover plate and liner.

2.15 WEATHERSTRIPPING MATERIALS

2.15.1 Door-Sill Weatherstripping

Weatherstripping shall consist of a 3 millimeter 1/8-inch thick by 35 millimeter 1-3/8-inch high neoprene strip housed in an extruded anodized aluminum housing approximately 1.8 millimeter 0.070 inchthick by 31 millimeter 1-1/4 inches high by the full width of the door and attached to the door with countersunk aluminum screws.

Door-sill weatherstripping shall consist of 3 millimeter 1/8-inchthick by 35 millimeter 1-3/8-inch high neoprene strip housed in an extruded architectural-bronze housing approximately 1.8 millimeter 0.070 inch thick by 31 millimeter 1-1/4 inches high by the full width of the door and attached to the door with countersunk brass or bronze screws.

2.15.2 Rain Drips

Drip for installation on the door exterior at the sill shall be extruded anodized aluminum approximately 2.40 millimeter thick by 35 millimeter 0.094 inch thick by 1-3/8 inches deep by 16 millimeter 5/8-inch projection.

Drip for installation on the door exterior at the sill shall be an extruded mill-finish architectural bronze approximately 2.40 millimeter thick by 35 millimeter 0.094 inch thick by 1-3/8 inches deep by 16 millimeter 5/8-inch

projection.

2.15.3 Meeting Rails

Weatherstripping for pairs of single-acting exterior doors shall consist of 3 millimeter 1/8-inch thick by 19 millimeter 3/4-inch wide feather-edged neoprene strips housed in extruded anodized aluminum "Z" shape strips 1.6 millimeter 0.065 inch thick by 25 millimeter 1 inch wide by the full height of the opening. There shall be one strip on each leaf overlapping.

Weatherstripping for pairs of single-acting doors shall consist of 3 millimeter 1/8-inch thick by 19 millimeter 3/4-inchtaper-edge neoprene strips, housed in extruded architectural bronze "Z" shape strip, 1.6 millimeter 0.065 inch thick by 25 millimeter 1 inch wide by the full height of the opening. There shall be one strip on each leaf overlapping.

PART 3 EXECUTION

3.1 GENERAL

Hardware shall be installed and adjusted in accordance with the manufacturer's printed instructions and to template dimensions.

3.2 HARDWARE LOCATION

Hardware shall be located in accordance with the following except when template dimensions and multiple-item installation require alternate locations:

HARDWARE ITEM	LOCATION
Top hinge	Centerline of the hinge shall be not more than 280 millimeter below the top of the door.
Bottom hinge	Centerline of the hinge shall be not more than 330 millimeter above the finished floor line.
Intermediate hinge	Equidistant between the top and bottom hinges or pivots
Knob lock and latch strike	1024 millimeter above the finished floor to the center of the lock strike
Deadlock strikes	1500 millimeter above the finished floor to the center of the lock strike
Exit bolt	Aligned in a horizontal position with the centerline of the strike 1024 millimeter above the finished floor
Roller latches	1024 millimeter above the finished floor to the center of the strike
Roller bumpers	At the top of the door near the edge of the lock stile
Door closer	Installed and adjusted in accordance with

HARDWARE ITEM	LOCATION
	template dimensions. Except where impracticable, the closer shall be mounted on the room side of doors opening into corridors, halls, and reception areas.
Door pulls on plates	Centerline of the pull, 1024 millimeter above the finished floor
Door pulls	Centerline of the pull, 1024 millimeter above the finished floor
Combination push-	Centerline of the plate, 1150 millimeter above the finished floor
Flush cup pulls	Centerline 1016 millimeter above the finished floor
Push plates	Center of plate 1200 millimeter above the finished floor
Single push bars	1092 millimeter above the finished floor
Double push bars	Centerline 1067 millimeter above the finished floor
Kick plates	Installed on the push side of single-acting doors and on both sides of double-acting doors
Extension lever flush bolts	Installed in the edge of the door. Bolt fronts shall be centered in accordance with the length of the lever extension.

HARDWARE ITEM	LOCATION
Top hinge	Centerline of the hinge shall be not more than 11 inches below the top of the door.
Bottom hinge	Centerline of the hinge shall be not more than 13 inches above the finished floor line.
Intermediate hinge	Equidistant between the top and bottom hinges or pivots
Knob lock and latch strike	40-5/16 inches above the finished floor to the center of the lock strike
Deadlock strikes	60 inches above the finished floor to the center of the lock strike
Exit bolt	Aligned in a horizontal position with the centerline of the strike 40-5/16 inches above the finished floor

HARDWARE ITEM	LOCATION
Roller latches	40-5/16 inches above the finished floor to the center of the strike
Roller bumpers	At the top of the door near the edge of the lock stile
Door closer	Installed and adjusted in accordance with template dimensions. Except where impracticable, the closer shall be mounted on the room side of doors opening into corridors, halls, and reception areas.
Door pulls on plates	Centerline of the pull, 40-5/16 inches above the finished floor
Door pulls	Centerline of the pull, 40-5/16 inches above the finished floor
Combination push-	Centerline of the plate, 45-5/16 inches above the finished floor
Flush cup pulls	Centerline 40 inches above the finished floor
Push plates	Center of plate 48 inches above the finished floor
Single push bars	43 inches above the finished floor
Double push bars	Centerline 42 inches above the finished floor
Kick plates	Installed on the push side of single-acting doors and on both sides of double-acting doors
Extension lever flush bolts	Installed in the edge of the door. Bolt fronts shall be centered in accordance with the length of the lever extension.

3.3 LOCKSET FUNCTIONS

Lockset and latch functions shall be provided for doors in accordance with ANSI/BHMA A156.2.

3.4 FINAL ADJUSTMENT

Final hardware adjustment shall be made and the maintenance personnel shall be instructed in adjustment, care, and maintenance of the hardware, and provided with information and lists for Spare Parts.

3.5 ADJUSTMENT WRENCHES

Three sets of hardware adjustment wrenches shall be delivered before completion of the project. Each set shall contain adjustment wrenches for locksets, control valve keys for door closers, dogging devices for exit

bolts, and emergency keys for toilet lock sets.

3.6 HARDWARE SCHEDULE

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NOTE: This paragraph must be developed by the designer in accordance with the requirements of each project.

Schedule must specify the exact item by the referenced specification numbers, trim, design, material, finish, and quantity for each hardware item.

Schedule must locate and schedule each door, door swing, and bevel; dimensions and thickness of the door, whether the door is wood or metal; fire rating, special door requirements, and type of frame.

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-- End of Section --